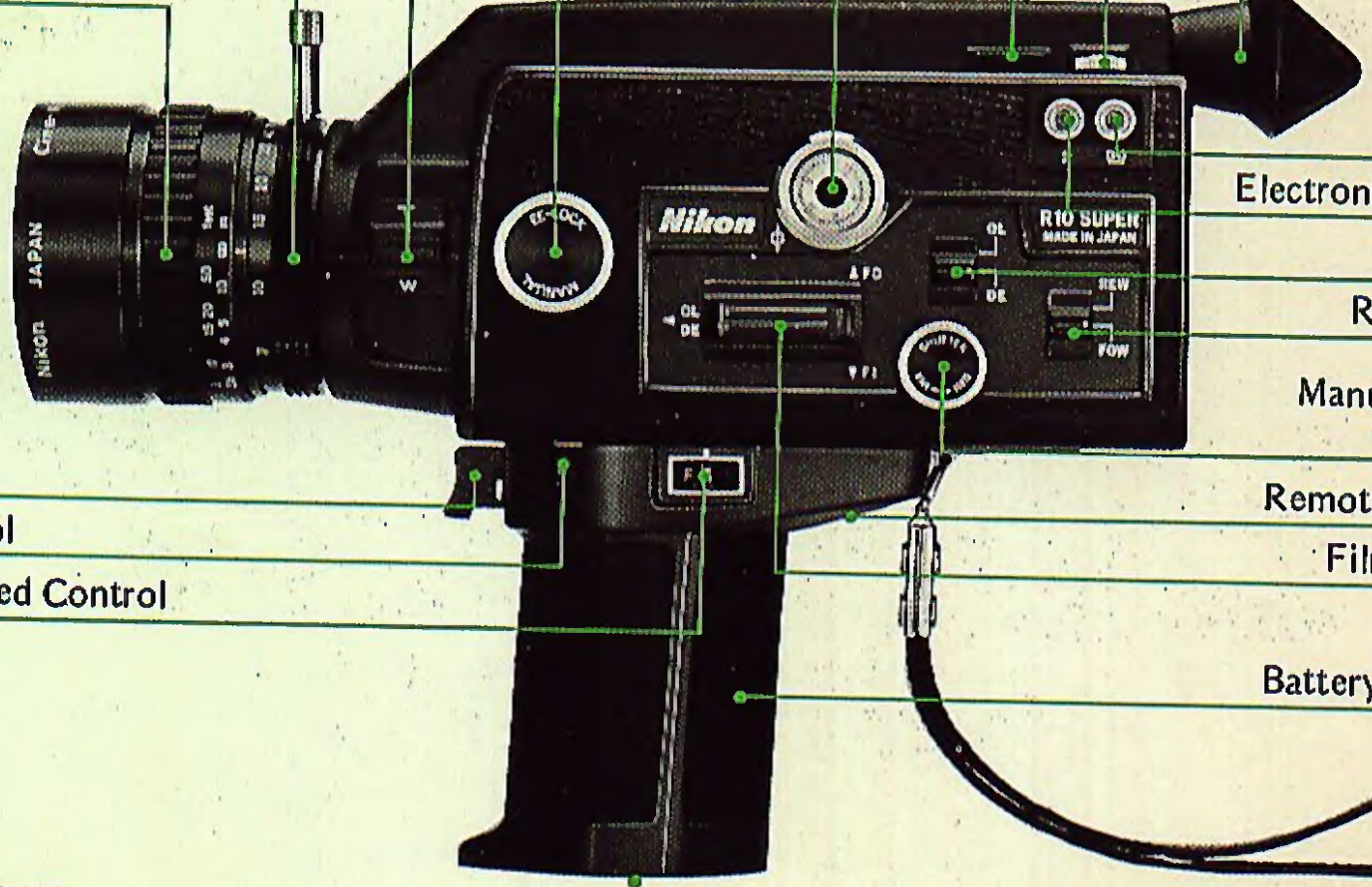
Nikon

R10

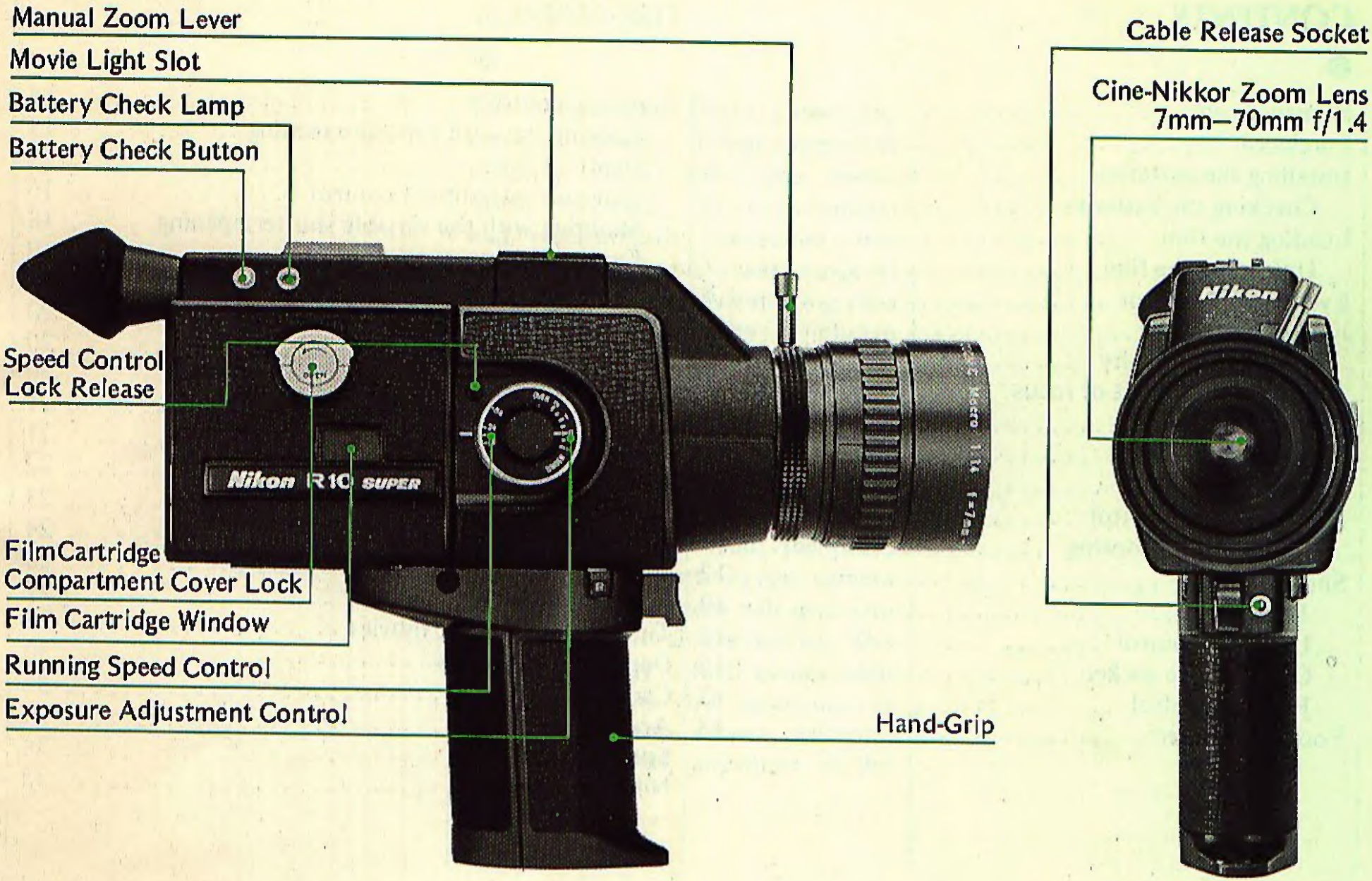
SUPER ZOOM

INSTRUCTION MANUAL

NOMENCLATURE



EE Lock/Manual Aperture Setting Ring
Zooming Switch
Zoom Ring
Focusing Ring
Trigger
Lock-Run Control
Power Zoom Speed Control
Footage Counter
Accessory Shoe
Eyepiece Shutter Control
Eyepiece Adjustment Ring
Eyecup
Tape Recorder Synch Terminal
Electronic Flash Terminal
OL/DE Switch
REW/FOW Switch
Manual Shutter Blade Opening Control
Remote Control Socket
Film Effect Control
Battery Chamber Cover
Tripod Socket


Manual Zoom Lever
Movie Light Slot
Battery Check Lamp
Battery Check Button
Speed Control Lock Release
Film Cartridge Compartment Cover Lock
Film Cartridge Window
Running Speed Control
Exposure Adjustment Control
Hand-Grip
Cable Release Socket
Cine-Nikkor Zoom Lens 7mm—70mm f/1.4
Nikon R10 SUPER
Nikon

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FOREWORD

The Nikon R10 Super Zoom cine camera combines a high degree of handling convenience with operational versatility. Fully automatic and electronically controlled, this camera incorporates a wide range of features for basic movie making, plus the extended capability of plug-in facilities for more technically demanding cinematography.

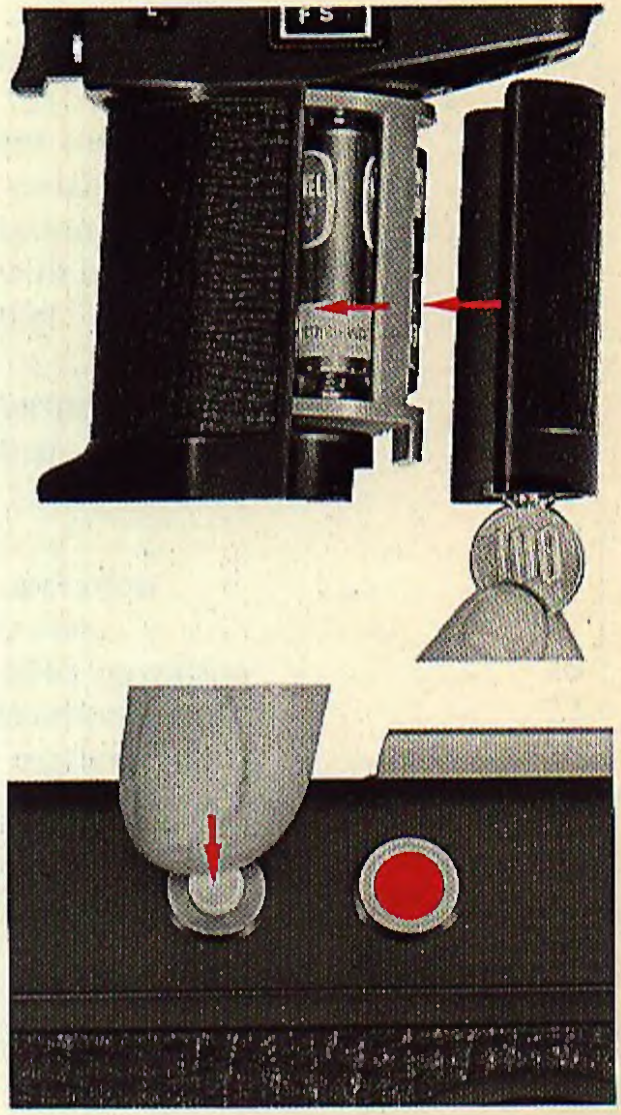
To get the most out of your Nikon R10 Super Zoom cine camera, read this booklet thoroughly and make certain you understand all the controls before you load the film. Follow the suggestions on camera care and your camera will give you many years of reliable service. The Nikon warranty which comes with your camera is your assurance of prompt, courteous service and complete satisfaction, anywhere in the world.

INSTALLING THE BATTERIES

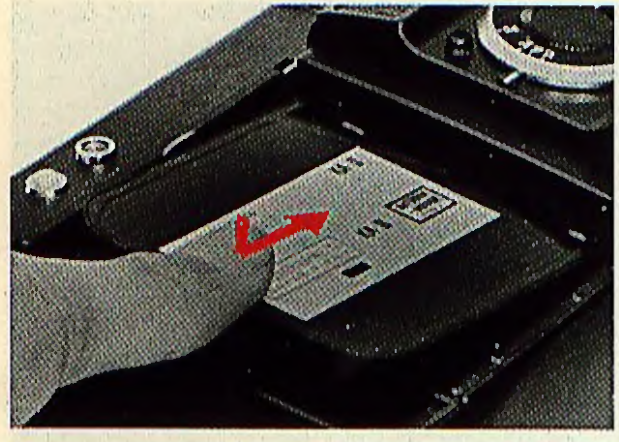
Six 1.5V penlight batteries power the electric motor of the film transport, exposure meter and the zoom motor. The battery housing is in the hand-grip. To install, remove the screw with a small coin or similar object and lift out the battery container. Place six batteries in the container, making sure that the positive and negative (+ and –) terminals are lined up according to the diagram in the battery container. To ensure reliable service at cold temperatures, the use of alkaline-manganese batteries is recommended. When you are expecting to do a lot of shooting, take along a spare set of fresh batteries. A new set of batteries will normally last for approximately 15 cartridges of film.

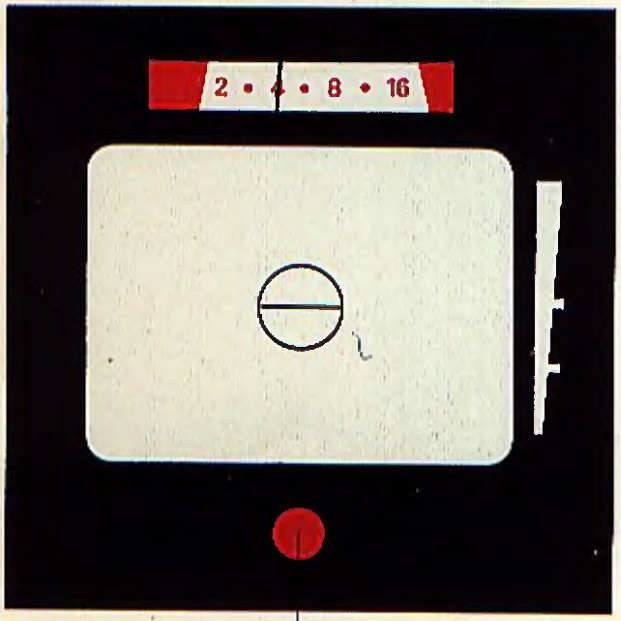
Checking the Batteries

A built-in battery checker lets you check the condition of the batteries. Depress the white button and the lamp will glow red to indicate that the batteries have been properly inserted and their power is adequate. If not, replace all six batteries.



LOADING THE FILM





Film End Mark

The camera accepts a Kodapak* instant-load cartridge containing 50 feet of Super-8 movie film. At a film speed of 18 fps, this film will run for approximately three minutes and twenty seconds. To load the camera, turn the cartridge compartment lock in the direction of the arrow and swing open the flap from the top. Place a cartridge in the compartment with the label facing up and the cartridge notches toward the lens. Then push it forward until it clicks into place. The ASA film speed is set automatically. The name of the film can be seen in the window on the flap.

Caution: To prevent improper operation of the camera's servo-EE mechanism, as well as excessive battery drain, do not operate the trigger until after a film cartridge has been installed.

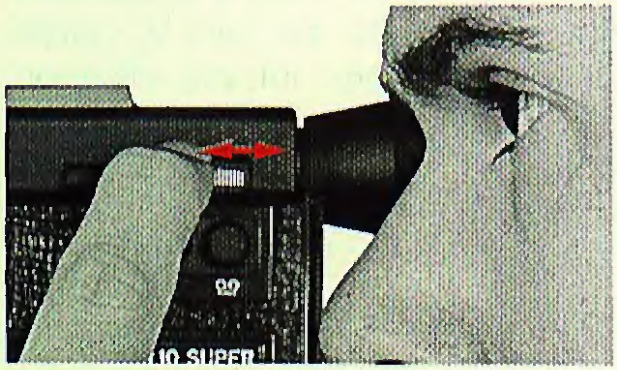
Unloading the Film

When the red warning circle appears in the viewfinder and the footage counter reads 50, the end of the film cartridge has been reached. Open the camera and slip out the cartridge. The word "exposed" will appear on the film to indicate that it has been exposed and prevent mix-ups. If you load a partially exposed cartridge, the red circle in the viewfinder is the only indicator to tell you when you have reached the end of the film.

*Kodapak is a registered trademark of the Eastman Kodak Company.

EYESIGHT ADJUSTMENT

To adjust the viewfinder eyepiece for your own eyesight, look through the viewfinder and turn the eyepiece adjustment ring until the image circle in the center is sharp. The eyepiece should not require readjustment unless the camera is used by more than one person. The rubber eyecup keeps out stray light and can be rotated to allow you to view with either eye. It can also be folded back for those who wear glasses.



FOCUSING

Aim the camera so that an edge of the subject falls within the central focusing spot and turn the focusing ring until the two halves of the image coincide to form one continuous sharp image. The lens focuses from infinity (∞) down to 5 feet (1.5m). For pinpoint focusing, focus with the lens at its maximum focal length, then reduce the focal length for the desired picture composition.

Out of focus

In focus

Macrophotography

The Cine-Nikkor zoom lens incorporates an override for macrophotography without any accessories. You may actually focus down until the subject comes in contact with the front lens element (a distance of 170mm from the film plane). First set the lens at infinity (∞) and the zoom ring to any focal length below 60mm. Then push the zoom ring forward. To focus in macro mode, turn the zoom ring instead of the focusing ring. The orange numbers uncovered in this procedure are the macro distance scale and serve as a rough focusing guideline. Do not use them for scale focusing.

Shifting the Point of Focus

Shifting the point of focus rapidly between a close subject and a distant subject can add interest to your films. The procedure for a shift from near to distant is as follows:

1. Secure the camera to a tripod or other firm support to prevent camera shake.
2. Focus the camera on the distant subject, using the focusing ring.
3. Without disturbing the focusing ring setting, push the zoom ring all the way forward for macro mode.
4. Focus on the near subject using the zoom ring, as explained previously.
5. Begin filming of the near subject now in focus.
6. While continuing to depress the trigger, pull back the zoom ring to its normal position. The distant subject will now be in focus.
7. Continue depressing the trigger until the desired amount of footage has been exposed.

Important: In macrophotography or focal-shift filming, camera shake is magnified many times and results in blurred images. For best results, always mount the camera on a tripod or other firm support.

ZOOMING

Power Zooming

Look through the viewfinder and push the zooming switch upward (T) for telephoto or downward (W) for wideangle until the picture includes as much or as little as you wish. A white line opposite the 9 position scale on the zoom ring indicates the set focal length. Zooming stops automatically after the completion of the zooming cycle.

Power zooming is available at two different speeds for even and jerk-free tracking shots. The power zoom speed control offers a selection of fast (F) and slow (S) settings. Turn the knob to the desired speed as indicated opposite the white line. The duration of zooming is a minimum of four seconds at the F setting and seven seconds at the S setting; these values will vary, however, with the condition of the batteries.

Important: When battery power is inadequate, the zoom motor will falter, especially at the slow speed setting. This indicates the need for the immediate replacement of the batteries.

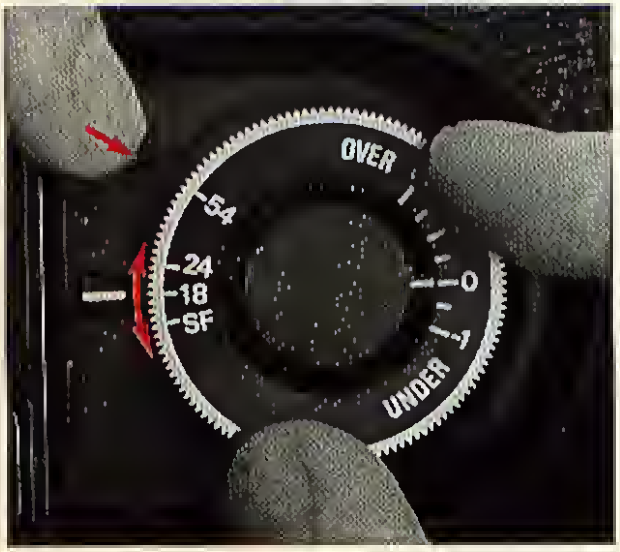
Also avoid using the camera with the lens at its greater focal lengths without a tripod, as holding the camera steady for telephoto shooting is almost impossible.

Manual Zooming

You can override the power zooming mechanism simply by turning the telescoping manual zoom lever protruding from the lens barrel. Manual zooming is recommended to preselect a lens focal length accurately, obtain jumps in focal lengths or match the speed of zooming to that of an approaching subject.

RUNNING SPEED CONTROL

The camera can be set to run at 18, 24 or 54 frames per second (fps) plus single frame (SF). Depress the lock release button and turn the running speed control dial until the desired speed clicks into place opposite the white line. Exposure compensation for the selected speed is automatic. Do not set the camera for intermediate speeds between the click-stop settings. Avoid the excessive use and dry run of the camera at 54 fps.



The 18 fps is usually recommended, though some photographers prefer 24 fps since the higher speed tends to give smoother, less bouncy images when projected. The 54 fps can be used for occasional slow-motion effects.

Single-Frame Shooting

With single-frame exposures you can make inanimate objects come alive on the screen. Just move the object you are filming a fraction of an inch after each exposure. Single-frame exposures of slow-moving objects, such as clouds, will be speeded up greatly when projected. For example, if you film at 1 fps and project at 18 fps, objects will appear to move 18 times their actual speed. The automatic exposure control retains its function. For single-frame shooting, the use of a tripod and a cable release is recommended. Remember to close the eyepiece shutter control to prevent stray light from entering the eyepiece.

Note: Battery life is greatly shortened when shooting in single-frame mode; instead of the normal battery life of 15 film cartridges (at 18fps), batteries last for only two or three cartridges in SF.

SHUTTER RELEASE

Trigger

The trigger activates the exposure meter and the film feed electromagnetically. Lightly depressing the trigger halfway switches on the meter. Squeeze the trigger all the way when you are ready to shoot. The camera will stop without a trace of run-on when you release the trigger.

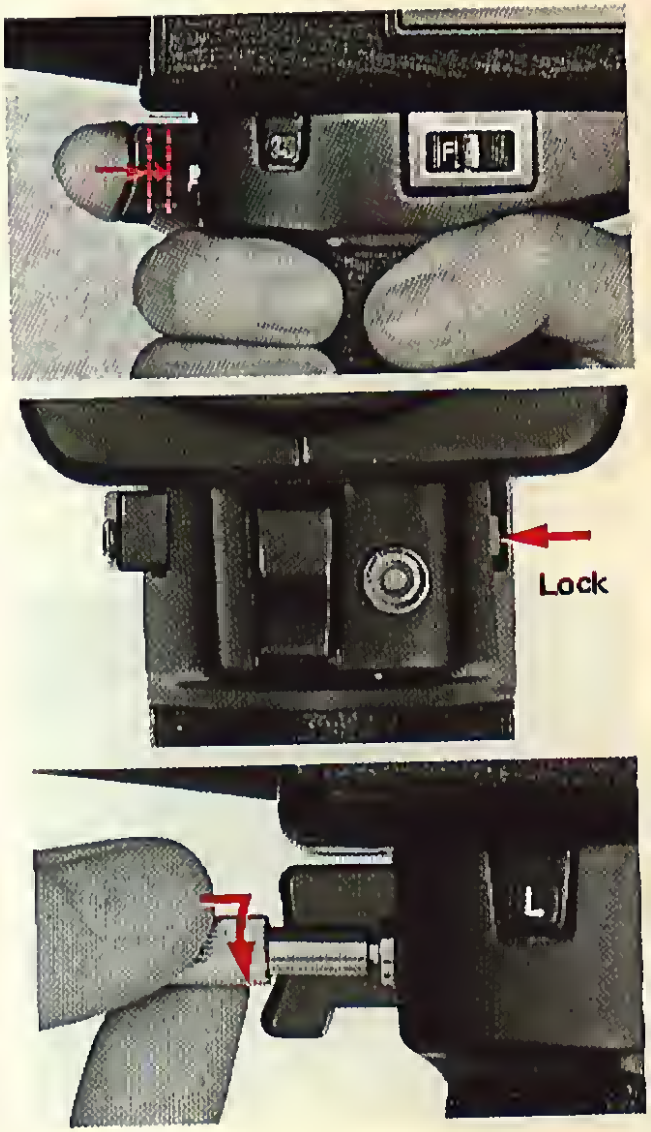
Caution: To prevent overexposure of the initial frames of each shooting sequence, it is essential that you observe these directions for a two-step triggering action. Use an initial light-pressured squeeze to turn on the meter; after the meter needle has stabilized, apply full pressure to trigger for filming.

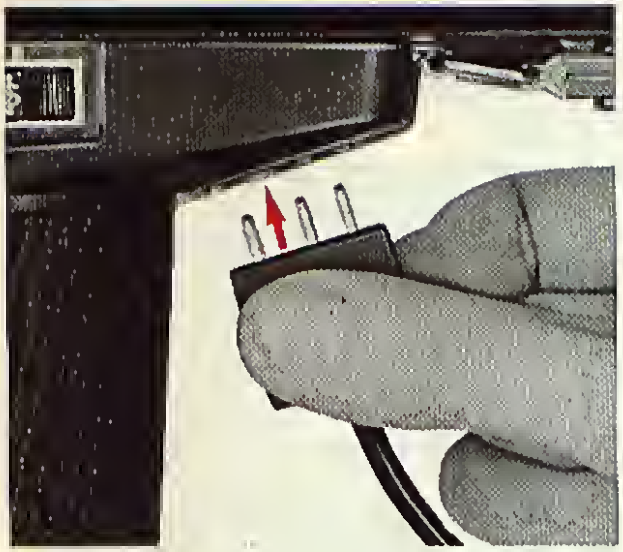
Lock-Run Control

The lock-run control locks the camera in the running position for continuous filming. Squeeze the trigger and depress the L side of the control. To stop the camera, push the R side. If you want to get in the movie yourself, mount the camera on a tripod or other firm support and set the camera for continuous running. The lock-run control also serves to prevent accidental triggering between takes.

Cable Release Socket

This accepts a standard cable release. It is recommended for use in making critical exposures such as close-ups, panning, fading or single-frame exposures with the camera mounted on a tripod.





Remote Control

The remote control socket accepts the accessory remote control unit and allows you to start and stop the camera from remote control release. This enables you to include yourself in your movie. It is also useful for filming wildlife studies where your presence might disturb the natural movements of the subject. The camera's electromagnetic automatic release permits shooting at any speed, including single frame. Remember to close the eyepiece shutter control.

FOOTAGE COUNTER

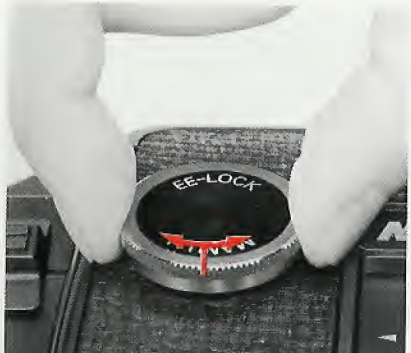
The footage counter indicates in both feet and meters the amount of film that has been exposed. Rewinding should not be done in the first and last 5ft/1.5m zones. The counter stops just past the film-end mark (E) and resets itself to zero when the camera is opened for reloading. If you remove the cartridge before the entire film is shot, make a note of the amount of film that has been exposed, since the counter cannot be set for intermediate readings.

EXPOSURE CONTROLS

The servo-controlled through-the-lens metering system automatically controls the lens diaphragm according to the scene brightness, the ASA speed of the film and the running speed of the camera. To switch on the meter, squeeze the trigger halfway to the first click-stop. The needle in the viewfinder continuously indicates what aperture the diaphragm will provide during exposure. When the available light is too bright or dim, the needle will swing into the red zone at the extreme right or left of the aperture scale to warn you of over- or underexposure. Under adverse lighting conditions, switch to a film whose ASA rating is suitable to the available light or mount a neutral density (ND) filter on the lens to reduce the light. An alternative method is the use of artificial lighting to increase luminosity.

For manual control, lift up the EE lock/manual aperture setting ring and turn it until the needle in the viewfinder swings to the desired aperture setting.

Note: The following two conditions should be considered normal meter operation—not an indication of meter failure. Condition 1: when the trigger is released, the meter needle will remain stationary at the last indicated aperture. Condition 2: should filming be started in low illumination conditions below the EV range of the camera, the meter needle will remain stationary; supplementary light should be added to obtain meter response.



Locking the Auto Exposure Reading

The EE lock/manual aperture setting ring also locks the automatic exposure reading. This is used to prevent the lens diaphragm from making undesirable reactions to light changes while shooting bright and dark subjects alternately or while tilting or panning the camera through a high-contrast background. It also permits you to hold the diaphragm at any desired aperture for deliberate under- or overexposure. To lock the automatically selected aperture, lift up the ring as you did for manual override. If you want deliberate under- or overexposure, reset the meter needle inside the viewfinder to a number higher or lower than the number the meter indicated on the scale after the exposure locking.

Depth of Field

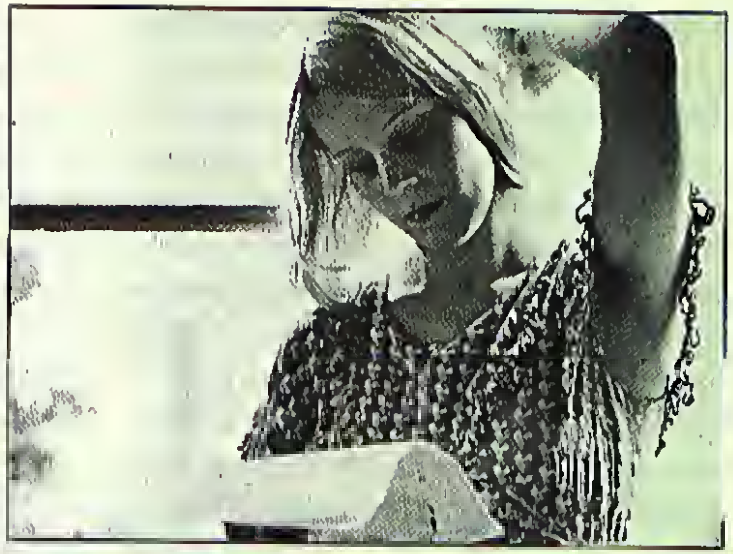
Depth of field is a zone extending i front of and behind the focuse distance. Within this zone blur is to slight to be noticeable and everythin will appear sharp when the film i projected on a screen. It extends greater distance behind the subject i focus than in front. Depth of fiel depends on three factors: lens aper ture, focal length and lens-to-subjec distance. Remember, the smaller th aperture and the shorter the foca length of the lens, the greater the depth of field. Also, the closer the subject, the smaller the depth o field. Since these three factors oper ate interdependently, one may cance out the effect of the others fo greater control over final results

Exposure Adjustment Control

When there are high-contrast lighting conditions, you may often obtain better results by readjusting the indicated exposure. The exposure adjustment control provides exposure compensation for higher or lower levels than the indicated exposure.

For backlighted subjects or a dark subject against a larger light background, turn the milled ring counterclockwise so that the white indicator line goes toward the OVER sign to open up the lens; for a light subject against a larger dark background, turn the ring toward the UNDER sign to stop down the lens. The numbers on the scale indicate one whole f/stop while the white lines between the numbers indicate a half-stop. The control can be set at any intermediate setting for more precise adjustment. Remember always to reset the ring to normal (0) after use.


2 • 4 • 8 • 16
OVER
UNDER



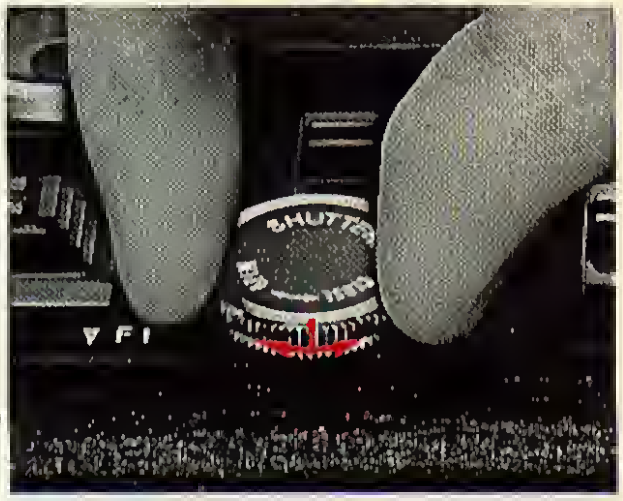

2 • 4 • 8 • 16
OVER
UNDER

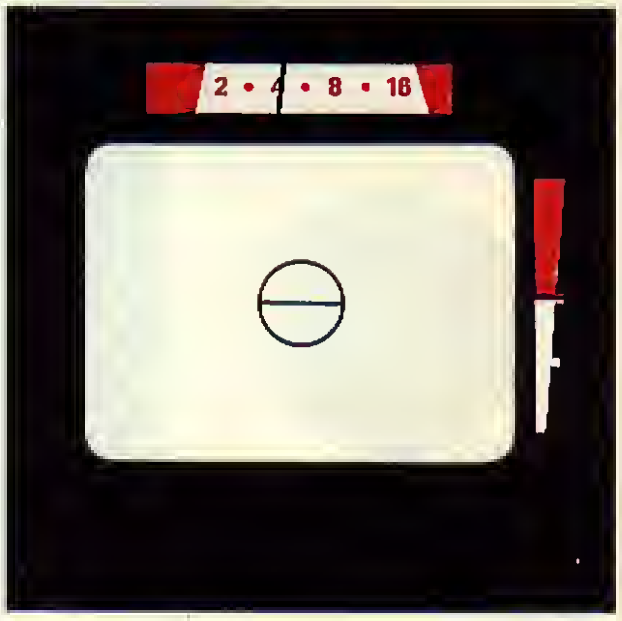
Shooting with the Variable Shutter Opening

The actual amount of exposure depends on the angle of the shutter opening and on the speed at which the shutter blade travels across the film. If the speed of travel remains constant, different exposure times are obtained solely by variations in the angle of the opening. This camera has a variable shutter which can cover a range of movement from fully open (160°) to totally closed (0°). When the shutter is opened at 80°, the effective exposure time per frame is thus only half of what it is with the 160° opening. The closing rate of the shutter opening can be checked in the viewfinder through the movement of the red indicator.

The table below shows the exposure times at each of three different angles of the shutter opening at three running speeds.

Since the shutter opening can be varied from fully open to fully closed, the variable shutter provides another means of exposure control. It also permits fading during filming. Its practical use is for cutting the exposure time. Reduced exposure time gives the same effect as increased shutter speeds and thus, small shutter openings are used to arrest fast movement. To close the shutter opening, depress the shutter blade opening control and turn it counterclockwise until the edge of the red indicator visible in the view-

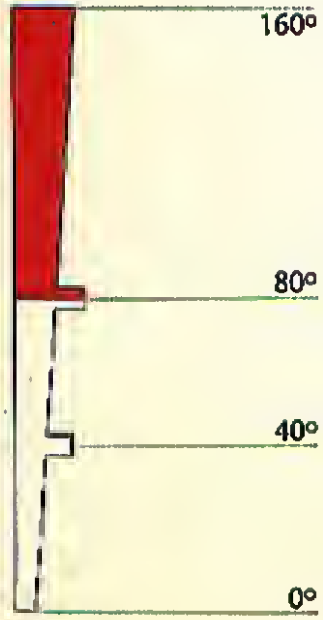




Shutter blade opening angle		(Full-opening) 160°	(1/2) 80°	(1/4) 40°
Running speed (fps)	18	1/40.5 sec.	1/81 sec.	1/162 sec.
	24	1/54 sec.	1/108 sec.	1/216 sec.
	54	1/121 sec.	1/243 sec.	1/486 sec.

finder, is opposite the appropriate mark in the window. The first mark represents the 80° opening setting; the second the 40° setting. When the edge of the red indicator reaches the bottom end of the window, the shutter is completely closed.

The manual use of the shutter blade opening control should be avoided except for the 80° or 40° setting.



Exposure Compensation

When the angle of the shutter opening is altered, the lens aperture must be adjusted to compensate for the change. The table below gives the exposure compensation for each opening. To compensate, turn the adjustment control until the white line is opposite the appropriate number.

Shutter blade opening angle	160°	80°	40°
Compensation	0	+1	+2

Exposure Control with Running Speeds

The different running speeds of the camera provide further means of exposure control since the exposure time is inversely proportional to the camera speed: the exposure per frame at 18 fps is three times as long as at 54 fps. Since films are usually shot at 18 fps, do not use this method of exposure control except for special effects.

EYEPIECE SHUTTER CONTROL

For remote control or special effects the eyepiece can be closed to prevent extraneous light from entering the eyepiece. To close, push the black slide at the top of the camera towards the lens.

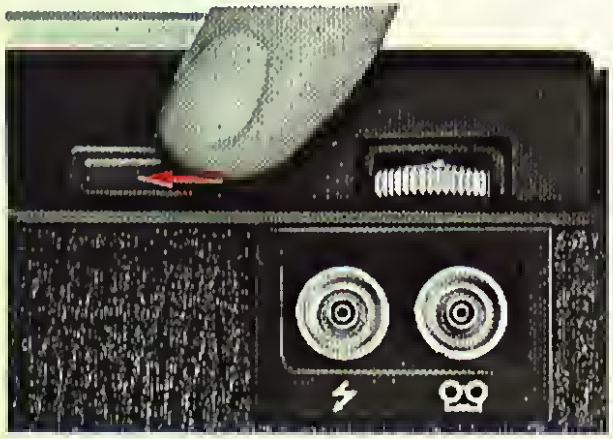
BUILT-IN FILTER

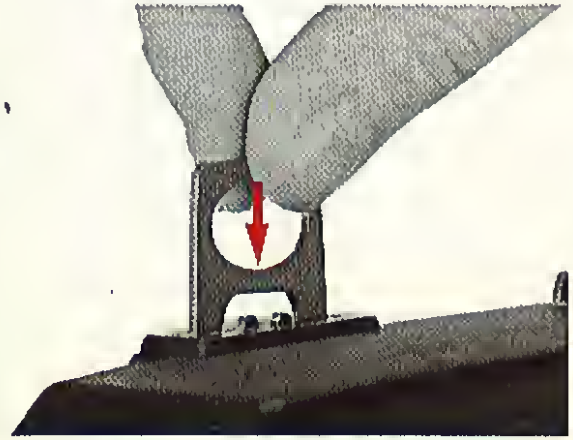
The camera has a built-in type A filter for shooting outdoors with Kodachrome* Type A film, which is intended for tungsten (artificial) lighting. When filming indoors under artificial light, displace the filter by inserting the filter key plate (included) into the movie light slot on top of the camera. When a standard Super-8 movie light is mounted on the camera, the filter is displaced automatically.

*Kodachrome is a registered trademark of the Eastman Kodak Company.

TAPE RECORDER SYNCH TERMINAL

The tape-recorder synch terminal accepts the accessory tape recorder synch cord. Pressing the trigger activates the tape recorder. This synchronizes filming and taping during the filming process.





ELECTRONIC FLASH TERMINAL

Accepts the synch cord, via which electronic flash units may be used to illuminate single-frame shots with the correct flash intensity and without the adverse effects of heat radiation. The camera synchronizes with electronic flash units at 160° fully open (1/40.5 sec.).

REMINDER CHECKLIST

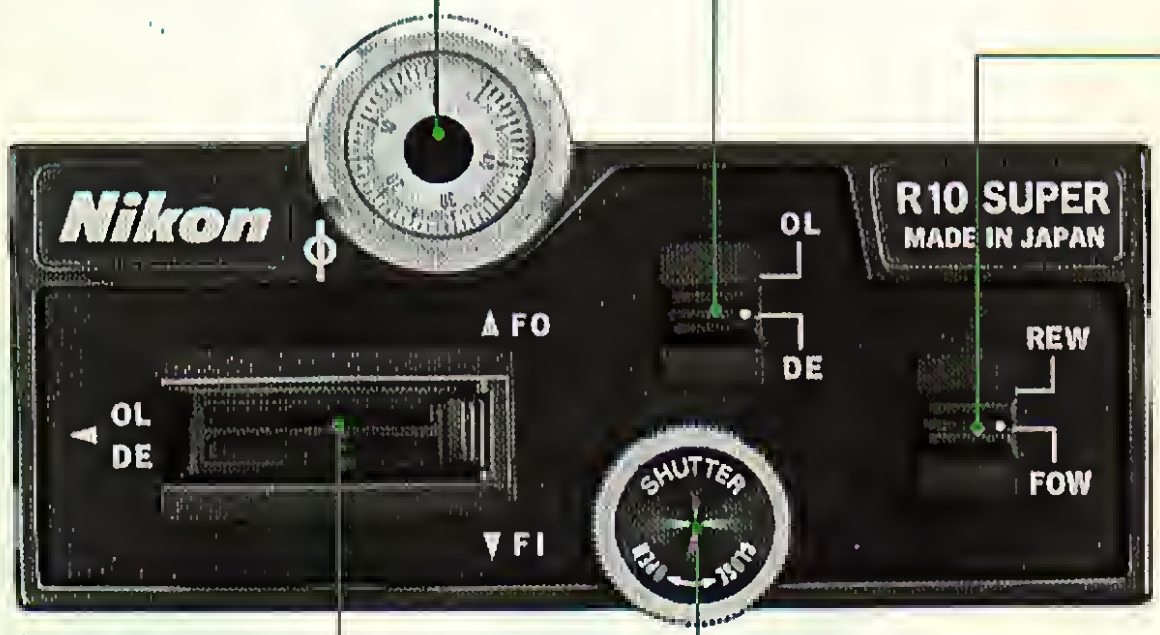
Double-check before you start shooting.

1. Check the batteries.
2. Set the exposure control on Auto (or Override).
3. Check the running speed control (fps).
4. Set the exposure adjustment control at 0.
5. Set the REW/FOW selector switch at FOW.
6. Check the inspection window inside the viewfinder to see that the variable shutter is fully opened.
7. Check the zoom ring on Normal (or Macro) control.
8. Release the lock-run control.

Note: The setting of the OL/DE switch (at either OL or DE) has no affect on normal filming.

CINE-TECHNIQUES

The variable shutter and automatic film rewind (up to approx.100 frames) on the Nikon R10 Super Zoom cine camera permit professional film effects such as overlaps, double exposures, fading and reverse filming. The viewfinder image remains bright during these operations and the automatic exposure control performs during all phases of shooting. All the controls are localized on one side for easy location by touch when your eye is at the viewfinder.



Fade-Out/Fade-In Operation

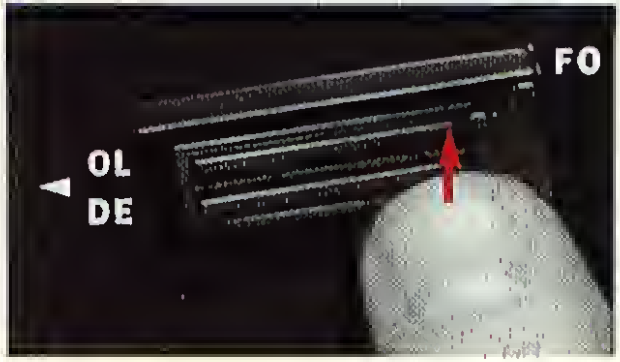
A cinematic device used to dramatically darken a scene gradually until it becomes entirely black (fade-out) or appears gradually out of darkness (fade-in) while the camera is running.

Manual fading

1. Begin filming in the normal manner.
2. To FADE-OUT: Depress the shutter blade opening control and slowly turn counterclockwise. Continue turning until the right-hand window in the viewfinder is completely red; this indicates that the shutter is completely closed. After finishing the fade-out sequence, release the trigger and return the shutter blade to its fully open condition by turning the shutter blade opening control clockwise.
3. To FADE-IN: Stop normal filming and close the shutter by turning the shutter blade opening control counterclockwise. Resume normal filming and gradually open the shutter by turning the shutter blade opening control clockwise. During the process of opening the shutter blade, the red indicator in the viewfinder will move upward until no longer visible; at this time the shutter blade is fully open and the fade-in is completed.

Power fading

1. Begin filming in the normal manner.
2. To FADE-OUT: Simply push the FE control upward (to FO) and hold until the right-hand window in the viewfinder is completely red; this indicates that the shutter blade is closed. After finishing the fade-out sequence, release the trigger and return the shutter to its fully open condition by depressing and turning the shutter blade opening control.
3. To FADE-IN: Stop normal filming and close the shutter blade using the shutter blade opening control, as in manual fading. Resume normal filming and push the FE control downward (to FI), holding until the red indicator in the viewfinder moves upward and is no longer visible. At this time the shutter blade is fully open and the fade-in sequence is completed.

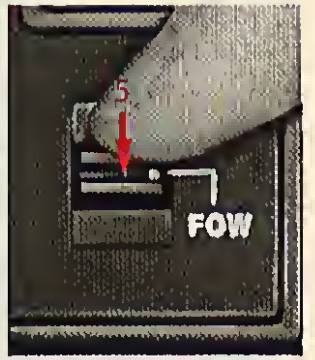


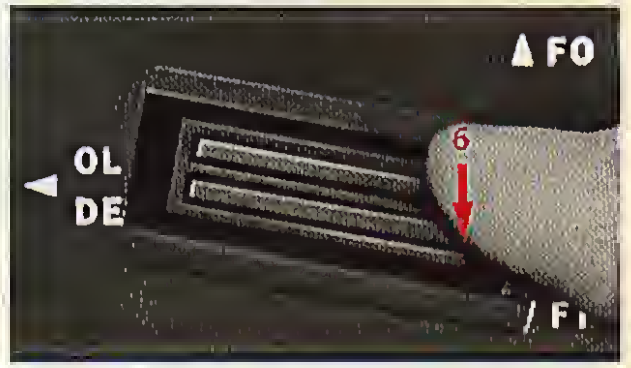
Overlap (OL) Operation

The overlap (also known as the dissolve or lap-dissolve) is a photographic effect whereby one scene gradually fades away, at the same time another scene gradually appears and takes its place.

1. Set the OL/DE switch to the OL position.
2. Aim the camera at the first scene and depress the trigger while maintaining the FE control in the forward position. Fade-out filming automatically stops (in about 5.5 sec. at 18 fps).
3. Set the REW/FOW switch to the REW position.
4. Depressing the trigger rewinds the film. Be sure to continue to hold the trigger depressed for rewinding until the film automatically stops. The film is now at the exact frame at which the fade-out began.
5. Set the REW/FOW switch to the FOW position.
6. To start the next scene with its superimposed fade-in, squeeze the trigger while maintaining the FE control in the downward position (FI).

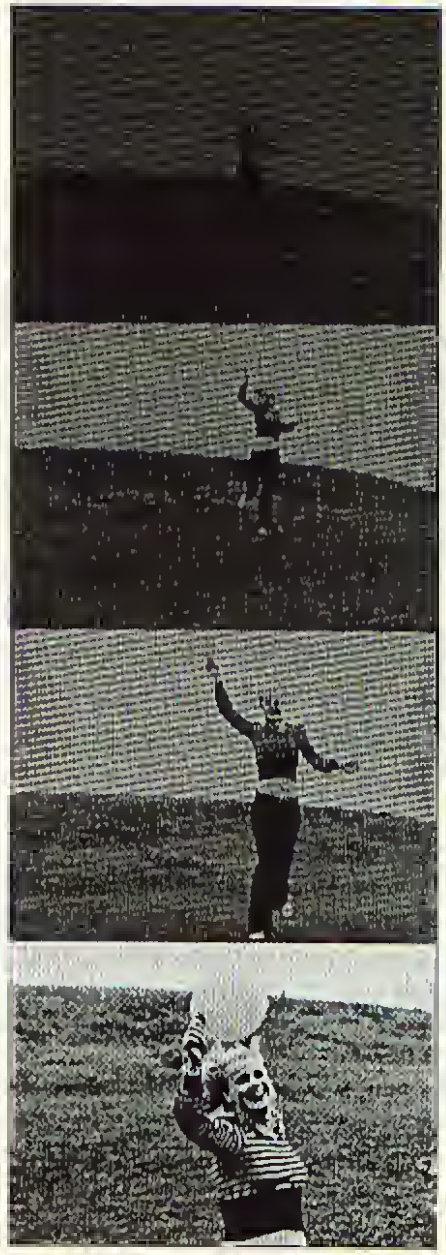
Caution: Do not attempt overlap shooting when the footage counter needle is within the first and last 5-foot zones and when shooting at 54 fps.





Fade-out

Fade-in



Overlap

Double Exposure (DE) Operation

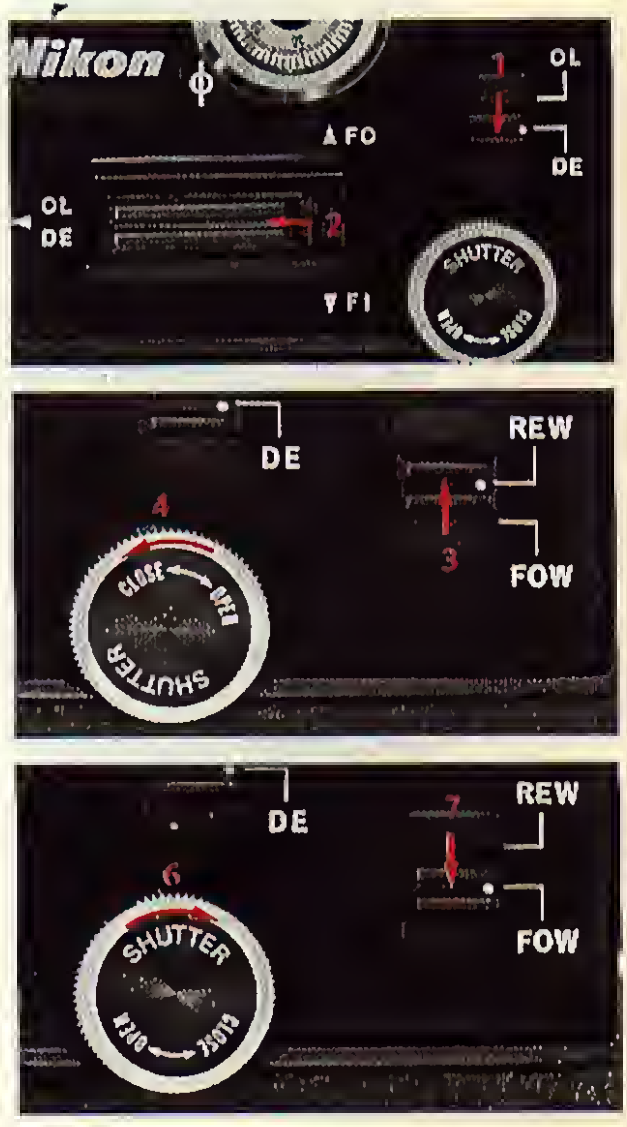
The automatic film rewind permits double exposures on the same strip of film. This is used for the creation of a ghost image or in the titling effect where white lettering is superimposed on a scene shot in a previous exposure.

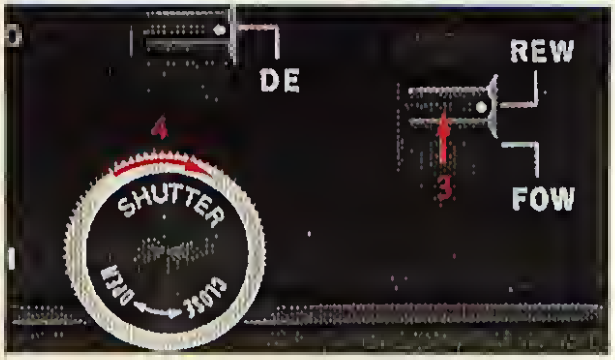
1. Set the OL/DE switch to the DE position.
2. Aim the camera at the first scene and depress the trigger while maintaining the FE control in the forward position. The camera automatically stops (in about 5.5 sec. at 18 fps).
3. Set the REW/FOW switch to the REW position.
4. Cover the lens with a lens cap or close the shutter opening with the shutter blade opening control.
5. Depressing the trigger rewinds the film. Be sure to continue to hold the trigger depressed for rewinding until the film automatically stops. The film is now at the exact frame at which the double-exposure run began.
6. Remove the lens cap or open the shutter.
7. Set the REW/FOW switch to the FOW position.
8. Depress the trigger for double exposures (at 18 fps: 5.5 sec.).

Note 1: A scene with letters or figures against a large, dark background is likely to deflate the exposure reading. To compensate, place a piece of non-glare paper or the grey side of a neutral test card in the copy position and read the light reflected from the paper. Then lock the exposure reading using the EE lock/manual aperture setting ring.

Note 2: Occasionally during double-exposure filming the first one or two frames or the last few frames do not match exactly and should be removed by editing.

Caution: Do not perform double-exposure filming when the footage counter needle is within the first and last 5-foot zones and when shooting at 54 fps.





Reverse Filming Operation

Reverse filming not only makes fascinating cinematography possible but it also achieves a number of special effects that would be impossible when filmed in the normal way.

1. Cover the lens with a lens cap or close the shutter opening with the shutter blade opening control.
2. Depress the trigger while maintaining the FE control in the forward position. Winding stops automatically (in about 5.5 sec. at 18 fps).
3. Set the REW/FOW switch to the REW position.
4. Reverse the operation performed in step 1 by either removing the lens cap or fully opening the shutter.
5. Depressing the trigger performs reverse filming. Filming automatically stops at the exact position where winding began (at 18 fps: 5.5 sec.).
6. Replace the lens cap or reclose the shutter opening.
7. Set the REW/FOW switch to the FOW position.
8. Depress the trigger to wind back the film sequence (at 18 fps: 5.5 sec.). (To prevent undesired double exposures at the end of the reverse action sequence, rewinding should be performed for a period longer than the already exposed frames; rewind for more than 100 frames and edit the unexposed film after development.) After rewinding, resume normal filming by either removing the lens cap or fully open the shutter.

Note: Although the 100-frame reverse filming sequence is performed automatically, it can be shortened to less than 100 frames by releasing your hold on the trigger before the filming automatically stops.

Caution: Do not perform reverse filming when the footage counter needle is within the first and last 5-foot zones and at a film speed of 54 fps.

TIPS FOR BETTER HOME MOVIES

Knowledgeable use of a few basic techniques is what distinguishes professional moviemakers. The following are some simple suggestions designed to help you improve your own home movies. With just a little practice, you can increase your pleasure in creating movies. And your audiences will get more pleasure from seeing your efforts, too.

Hold the Camera Level:
Hold the camera level with respect to the horizon when shooting. A tilted horizon line can disturb the overall effect when projected on a screen.

Hold the Camera Steady:
Practice holding the camera steady. Camera movement is the worst enemy of sharpness and results in bouncy, amateurish-looking films. For critical shooting at close range, it would be wise to mount the camera on a tripod or other firm support.

Hold Your Shots Long Enough:
Avoid short bursts. Make each shot at least seven seconds long and use longer shots for interesting action.

Shoot "Reaction" Shots:
While you are filming a race, football game or other event, shoot close-ups of the spectators' faces as they react to peaks of action. Splice these into the main footage and they will add drama and human interest to your film.

When Shooting From a Car:
Set the lens at widcangle, shoot preferably at 24 fps and point the camera no more than 45 degrees away from the direction in which the car is traveling. This will help to smooth out bumps and prevent blur. Shooting directly across the direction of travel will cause an unpleasant blurry appearance.

Zooming:
Power zooming presents an almost irresistible temptation to include a zoom effect in every sequence. The result, however, is dizzying footage which will leave your audience bored by repetitiveness. Use the zoom sparingly or it will lose its effectiveness altogether. The secret of a good zoom is to hold the camera steady for a few seconds both before and after a zoom shot.

Panning:
Moving the camera to follow a moving subject or sweep across a panoramic scene is called panning. Use this technique sparingly and if you do pan, use a tripod with a pan head for the best results. Practice moving the camera slowly and evenly. Hold the camera steady on the first part of the scene for a moment, then pivot and follow through with the movement until after you have released the trigger.

Have a Story:
Before beginning a filming session establish a general story line to follow. In this way, your movie will contain scenes that take place in a natural logical order.

Edit Your Films:
When you're shooting action-packed sporting events or a baby's first steps, you don't have time to think about the best sequence of takes. Concentrate on getting what you want on film. Later on, snip out unwanted frames and arrange your best footage for maximum interest and drama. For home movies that look professional, an inexpensive movie editor is one of the best investments you can make.

DEPTH-OF-FIELD TABLES

f=7mm

Focused Distance	f/1.4	f/2	f/2.8	f/4	f/5.6	f/8	f/11	f/16
∞	9'10" ~∞	7' ~∞	5'2" ~∞	3'9" ~∞	2'9" ~∞	2'1" ~∞	1'7" ~∞	1'3" ~∞
∞	3.01 ~∞	2.14 ~∞	1.57 ~∞	1.14 ~∞	0.85 ~∞	0.63 ~∞	0.45 ~∞	0.38 ~∞
50	8'4" ~∞	6'3" ~∞	4'9" ~∞	3'6" ~∞	2'8" ~∞	2' ~∞	1'7" ~∞	1'3" ~∞
10	2.36 ~∞	1.80 ~∞	1.38 ~∞	1.04 ~∞	0.80 ~∞	0.61 ~∞	0.48 ~∞	0.37 ~∞
20	6'9" ~∞	5'4" ~∞	4'3" ~∞	3'3" ~∞	2'6" ~∞	1'11" ~∞	1'7" ~∞	1'3" ~∞
5	1.94 ~∞	1.55 ~∞	1.24 ~∞	0.96 ~∞	0.76 ~∞	0.58 ~∞	0.47 ~∞	0.37 ~∞
15	6'2" ~∞	5' ~∞	4' ~∞	3'1" ~∞	2'5" ~∞	1'11" ~∞	1'6" ~∞	1'2" ~∞
4	1.78 ~∞	1.45 ~∞	1.18 ~∞	0.93 ~∞	0.74 ~∞	0.57 ~∞	0.46 ~∞	0.36 ~∞
10	5'2" ~∞	4'4" ~∞	3'7" ~∞	2'11" ~∞	2'4" ~∞	1'10" ~∞	1'6" ~∞	1'2" ~∞
3	1.56 ~∞	1.31 ~∞	1.09 ~∞	0.87 ~∞	0.70 ~∞	0.56 ~∞	0.45 ~∞	0.36 ~∞
7	4'4" ~22'3"	3'9" ~∞	3'2" ~∞	2'7" ~∞	2'2" ~∞	1'9" ~∞	1'5" ~∞	1'2" ~∞
2	1.26 ~5.51	1.10 ~27.8	0.94 ~∞	0.78 ~∞	0.65 ~∞	0.52 ~∞	0.43 ~∞	0.35 ~∞
5	3'6" ~9'4"	3'1" ~15'6"	2'9" ~176'	2'4" ~∞	2" ~∞	1'8" ~∞	1'4" ~∞	1'1" ~∞
1.5	1.06 ~2.76	0.94 ~4.47	0.83 ~32.3	0.71 ~∞	0.60 ~∞	0.50 ~∞	0.42 ~∞	0.34 ~∞

(ft) (m)

f=10mm

Focused Distance	f/1.4	f/2	f/2.8	f/4	f/5.6	f/8	f/11	f/16
∞	19'5" ~∞	13'8" ~∞	9'11" ~∞	7' ~∞	5'1" ~∞	3'8" ~∞	2'9" ~∞	2' ~∞
∞	5.92 ~∞	4.18 ~∞	3.01 ~∞	2.14 ~∞	1.56 ~∞	1.12 ~∞	0.84 ~∞	0.61 ~∞
50	14'1" ~∞	10'10" ~∞	8'4" ~∞	6'3" ~∞	4'8" ~∞	3'6" ~∞	2'8" ~∞	1'11" ~∞
10	3.77 ~∞	2.99 ~∞	2.35 ~∞	1.79 ~∞	1.37 ~∞	1.03 ~∞	0.79 ~∞	0.59 ~∞
20	10' ~∞	8'3" ~∞	6'9" ~∞	5'4" ~∞	4'2" ~∞	3'2" ~∞	2'6" ~∞	1'11" ~∞
5	2.76 ~31.4	2.32 ~∞	1.93 ~∞	1.54 ~∞	1.22 ~∞	0.95 ~∞	0.75 ~∞	0.56 ~∞
15	8'7" ~64'	7'4" ~∞	6'1" ~∞	4'11" ~∞	3'11" ~∞	3'1" ~∞	2'5" ~∞	1'10" ~∞
4	2.43 ~12.0	2.09 ~∞	1.77 ~∞	1.44 ~∞	1.16 ~∞	0.91 ~∞	0.73 ~∞	0.55 ~∞
10	6'9" ~20'	5'11" ~35'6"	5'2" ~∞	4'3" ~∞	3'6" ~∞	2'10" ~∞	2'3" ~∞	1'9" ~∞
3	2.04 ~5.89	1.79 ~10.3	1.55 ~∞	1.30 ~∞	1.07 ~∞	0.86 ~∞	0.69 ~∞	0.54 ~∞
7	5'3" ~10'7"	4'9" ~13'8"	4'3" ~22'8"	3'8" ~∞	3'1" ~∞	2'7" ~∞	2'1" ~∞	1'8" ~∞
2	1.53 ~2.92	1.40 ~3.67	1.25 ~5.60	1.08 ~29.8	0.93 ~∞	0.76 ~∞	0.63 ~∞	0.50 ~∞
5	4'1" ~6'6"	3'9" ~7'6"	3'6" ~9'6"	3'1" ~16'	2'8" ~279'	2'3" ~∞	1'11" ~∞	1'7" ~∞
1.5	1.23 ~1.94	1.14 ~2.24	1.05 ~2.81	0.93 ~4.62	0.81 ~42.1	0.69 ~∞	0.59 ~∞	0.48 ~∞

f=15mm

Focused Distance	f/1.4	f/2	f/2.8	f/4	f/5.6	f/8	f/11	f/16
∞	42'5" ~∞	29'9" ~∞	21'4" ~∞	15' ~∞	10'9" ~∞	7'7" ~∞	5'7" ~∞	3'11" ~∞
∞	12.9 ~∞	9.07 ~∞	6.50 ~∞	4.57 ~∞	3.29 ~∞	2.32 ~∞	1.71 ~∞	1.20 ~∞
50	23'1" ~∞	18'9" ~∞	15' ~∞	11'7" ~∞	8'11" ~∞	6'8" ~∞	5'1" ~∞	3'8" ~∞
10	5.67 ~43.9	4.79 ~∞	3.97 ~∞	3.16 ~∞	2.50 ~∞	1.90 ~∞	1.47 ~∞	1.08 ~∞
20	13'8" ~37'6"	12'1" ~60'4"	10'5" ~326'	8'8" ~∞	7'1" ~∞	5'7" ~∞	4'5" ~∞	3'4" ~∞
5	3.63 ~8.08	3.25 ~11.0	2.86 ~21.4	2.42 ~∞	2.01 ~∞	1.61 ~∞	1.30 ~∞	0.99 ~∞
15	11'2" ~23'	10'1" ~29'10"	8'11" ~49'10"	7'7" ~∞	6'4" ~∞	5'2" ~∞	4'2" ~∞	3'2" ~∞
4	3.08 ~5.74	2.80 ~7.06	2.51 ~10.2	2.17 ~31.8	1.84 ~∞	1.50 ~∞	1.22 ~∞	0.94 ~∞
10	8'2" ~13'	7'7" ~14'10"	6'11" ~18'6"	6'1" ~29'4"	5'4" ~141'	4'5" ~∞	3'8" ~∞	2'11" ~∞
3	2.45 ~3.87	2.28 ~4.42	2.08 ~5.47	1.84 ~8.54	1.60 ~34.8	1.34 ~∞	1.12 ~∞	0.88 ~∞
7	6'1" ~8'4"	5'9" ~9'	5'4" ~10'3"	4'10" ~12'10"	4'4" ~19'4"	3'9" ~88'4"	3'3" ~∞	2'7" ~∞
2	1.75 ~2.34	1.66 ~2.53	1.55 ~2.84	1.42 ~3.47	1.27 ~4.95	1.11 ~14.2	0.95 ~∞	0.78 ~∞
5	4'6" ~5'7"	4'4" ~5'11"	4'1" ~6'5"	3'10" ~7'4"	3'6" ~9'	3'1" ~13'11"	2'9" ~46'5"	2'4" ~∞
1.5	1.36 ~1.68	1.30 ~1.77	1.24 ~1.91	1.15 ~2.17	1.06 ~2.66	0.94 ~4.06	0.83 ~12.2	0.70 ~∞

f=20mm

Focused Distance	f/1.4	f/2	f/2.8	f/4	f/5.6	f/8	f/11	f/16
∞	75' ~∞	52'6" ~∞	37'7" ~∞	26'4" ~∞	18'10" ~∞	13'3" ~∞	9'8" ~∞	6'8" ~∞
∞	22.9 ~∞	16.0 ~∞	11.4 ~∞	8.03 ~∞	5.75 ~∞	4.03 ~∞	2.95 ~∞	2.04 ~∞
50	30'1" ~149'	25'8" ~87'4"	21'6" ~∞	17'4" ~∞	13'9" ~∞	10'6" ~∞	8'2" ~∞	5'11" ~∞
10	6.97 ~17.7	6.17 ~26.6	5.35 ~∞	4.47 ~∞	3.66 ~∞	2.89 ~∞	2.29 ~∞	1.70 ~∞
20	15'10" ~27'2"	14'6" ~32'2"	13'1" ~42'7"	11'5" ~83'2"	9'9" ~∞	8' ~∞	6'7" ~∞	5'1" ~∞
5	4.11 ~6.38	3.82 ~7.25	3.49 ~8.84	3.10 ~13.2	2.69 ~39.0	2.25 ~∞	1.87 ~∞	1.46 ~∞
15	12'6" ~18'8"	11'8" ~20'11"	10'9" ~24'10"	9'7" ~34'8"	8'5" ~73'7"	7'1" ~∞	5'11" ~∞	4'8" ~∞
4	3.41 ~4.84	3.21 ~5.31	2.98 ~6.12	2.68 ~7.93	2.37 ~13.1	2.02 ~∞	1.71 ~∞	1.37 ~∞
10	8'10" ~11'6"	8'5" ~12'4"	7'11" ~13'7"	7'3" ~16'	6'7" ~21'2"	5'9" ~40'10"	5' ~∞	4'1" ~∞
3	2.66 ~3.44	2.54 ~3.68	2.39 ~4.04	2.20 ~4.76	1.99 ~6.23	1.74 ~11.7	1.50 ~∞	1.23 ~∞
7	6'5" ~7'8"	6'2" ~8'1"	5'11" ~8'7"	5'7" ~9'6"	5'2" ~11'	4'8" ~14'8"	4'1" ~25'3"	3'6" ~∞
2	1.84 ~2.19	1.78 ~2.28	1.71 ~2.41	1.61 ~2.64	1.50 ~3.04	1.35 ~3.92	1.21 ~6.18	1.03 ~∞
5	4'8" ~5'4"	4'7" ~5'6"	4'5" ~5'9"	4'3" ~6'2"	4' ~6'9"	3.8" ~7'11"	3'4" ~10'2"	2'11" ~19'9"
1.5	1.41 ~1.60	1.38 ~1.65	1.33 ~1.72	1.27 ~1.83	1.20 ~2.01	1.11 ~2.36	1.01 ~3.01	0.88 ~5.65

(ft) (m)

f=30mm

Focused Distance	f/1.4	f/2	f/2.8	f/4	f/5.6	f/8	f/11	f/16
∞	167' ~∞	117' ~∞	83'9" ~∞	58'7" ~∞	41'10" ~∞	29'3" ~∞	21'3" ~∞	14'7" ~∞
∞	51.0 ~∞	35.7 ~∞	25.5 ~∞	17.9 ~∞	12.8 ~∞	8.92 ~∞	6.49 ~∞	4.46 ~∞
50	38'6" ~71'4"	35' ~87'4"	31'3" ~124'	26'11" ~345'	22'9" ~∞	18'5" ~∞	14'11" ~∞	11'3" ~∞
10	8.36 ~12.5	7.80 ~13.9	7.17 ~16.5	6.40 ~22.8	5.59 ~46.9	4.70 ~∞	3.92 ~∞	3.07 ~∞
20	17'10" ~22'9"	17'1" ~24'2"	16'1" ~26'4"	14'11" ~30'6"	13'6" ~38'2"	11'10" ~63'1"	10'3" ~359'	8'5" ~∞
5	4.55 ~5.55	4.38 ~5.82	4.17 ~6.23	3.90 ~6.97	3.59 ~8.27	3.19 ~11.5	2.81 ~22.3	2.34 ~∞
15	13'9" ~16'6"	13'3" ~17'3"	12'8" ~18'4"	11'11" ~20'3"	11' ~23'6"	9'11" ~31'1"	8'9" ~51'9"	7'4" ~∞
4	3.71 ~4.34	3.59 ~4.51	3.45 ~4.75	3.26 ~5.17	3.04 ~5.86	2.75 ~7.31	2.46 ~10.6	2.10 ~41.9
10	9'5" ~10'8"	9'2" ~10'11"	8'11" ~11'5"	8'6" ~12'1"	8'1" ~13'2"	7'5" ~15'4"	6'9" ~19'1"	5'11" ~32'5"
3	2.83 ~3.19	2.76 ~3.28	2.68 ~3.41	2.56 ~3.62	2.42 ~3.94	2.24 ~4.55	2.04 ~5.64	1.78 ~9.41
7	6'9" ~7'4"	6'7" ~7'5"	6'5" ~7'8"	6'3" ~8'	6' ~8'5"	5'7" ~9'3"	5'3" ~10'6"	4'8" ~13'8"
2	1.92 ~2.08	1.89 ~2.12	1.85 ~2.17	1.79 ~2.26	1.72 ~2.38	1.63 ~2.59	1.52 ~2.92	1.37 ~3.69
5	4'10" ~5'2"	4'9" ~5'3"	4'9" ~5'4"	4'7" ~5'6"	4'5" ~5'8"	4'3" ~6'1"	4' ~6'7"	3'8" ~7'8"
1.5	1.46 ~1.55	1.44 ~1.57	1.41 ~1.60	1.38 ~1.64	1.34 ~1.71	1.28 ~1.81	1.21 ~1.97	1.11 ~2.29

f=40mm

Focused Distance	f/1.4	f/2	f/2.8	f/4	f/5.6	f/8	f/11	f/16
∞	298' ~∞	209' ~∞	149' ~∞	104' ~∞	74'6" ~∞	52'1" ~∞	37'10" ~∞	25'11" ~∞
∞	91.0 ~∞	63.7 ~∞	45.5 ~∞	31.8 ~∞	22.7 ~∞	15.9 ~∞	11.5 ~∞	7.91 ~∞
50	42'9" ~60'2"	40'3" ~65'11"	37'4" ~75'6"	33'8" ~96'7"	29'10" ~153'	25'5" ~1330'	21'5" ~∞	17' ~∞
10	9.00 ~11.3	8.62 ~11.9	8.17 ~12.9	7.58 ~14.7	6.91 ~18.0	6.10 ~27.4	5.32 ~∞	4.38 ~∞
20	18'9" ~21'6"	18'3" ~22'2"	17'7" ~23'2"	16'9" ~24'10"	15'8" ~27'7"	14'4" ~32'10"	13' ~43'2"	11'2" ~90'7"
5	4.73 ~5.30	4.63 ~5.44	4.49 ~5.64	4.30 ~5.96	4.07 ~6.46	3.77 ~7.38	3.45 ~8.98	3.02 ~14.0
15	14'3" ~15'10"	14' ~16'2"	13'7" ~16'9"	13'1" ~17'7"	12'5" ~18'11"	11'7" ~21'4"	10'8" ~25'3"	9'5" ~36'7"
4	3.83 ~4.19	3.75 ~4.28	3.66 ~4.40	3.54 ~4.60	3.38 ~4.89	3.17 ~5.41	2.94 ~6.22	2.62 ~8.31
10	9'8" ~10'4"	9'6" ~10'6"	9'4" ~10'9"	9'1" ~11'1"	8'9" ~11'8"	8'4" ~12'6"	7'10" ~13'10"	7'1" ~16'8"
3	2.90 ~3.11	2.86 ~3.16	2.80 ~3.22	2.73 ~3.33	2.69 ~3.48	2.51 ~3.74	2.35 ~4.12	2.14 ~4.95
7	6'10" ~7'2"	6'9" ~7'3"	6'8" ~7'4"	6'6" ~7'7"	6'4" ~7'9"	6'1" ~8'2"	5'10" ~8'9"	5'5" ~9'10"
2	1.95 ~2.05	1.93 ~2.07	1.91 ~2.10	1.87 ~2.15	1.83 ~2.21	1.76 ~2.31	1.68 ~2.46	1.57 ~2.74
5	4'11" ~5'1"	4'10" ~5'2"	4'10" ~5'2"	4'9" ~5'3"	4'8" ~5'5"	4'6" ~5'7"	4'4" ~5'10"	4'1" ~6'4"
1.5	1.47 ~1.53	1.46 ~1.54	1.45 ~1.56	1.43 ~1.58	1.40 ~1.62	1.36 ~1.67	1.31 ~1.75	1.24 ~1.89

f=50mm

Focused Distance	f/1.4	f/2	f/2.8	f/4	f/5.6	f/8	f/11	f/16
∞	456' ~∞	319' ~∞	227' ~∞	159' ~∞	113' ~∞	79'6" ~∞	57'9" ~∞	39'7" ~∞
∞	139 ~∞	97.3 ~∞	69.5 ~∞	48.6 ~∞	34.7 ~∞	24.2 ~∞	17.6 ~∞	12.1 ~∞
50	45' ~56'3"	43'1" ~59'6"	40'10" ~73'4"	37'11" ~73'4"	34'6" ~90'	30'6" ~136'	26'7" ~386'	21'10" ~∞
10	9.31 ~10.8	9.04 ~11.2	8.71 ~11.7	8.25 ~12.7	7.71 ~14.2	7.02 ~17.2	6.31 ~23.6	5.40 ~61.1
20	19'1" ~21'	18'9" ~21'5"	18'4" ~22'	17'8" ~23'	16'11" ~24'6"	15'10" ~27'1"	14'8" ~31'2"	13'1" ~41'7"
5	4.82 ~5.20	4.74 ~5.29	4.65 ~5.41	4.51 ~5.61	4.34 ~5.89	4.11 ~6.38	3.85 ~7.11	3.48 ~8.77
15	14'6" ~15'7"	14'3" ~15'9"	14' ~16'1"	13'8" ~16'8"	13'2" ~17'5"	12'6" ~18'9"	11'9" ~20'7"	10'8" ~24'9"
4	3.88 ~4.13	3.83 ~4.18	3.77 ~4.26	3.68 ~4.38	3.56 ~4.56	3.40 ~4.85	3.22 ~5.26	2.95 ~6.14
10	9'9" ~10'3"	9'8" ~10'4"	9'7" ~10'6"	9'4" ~10'9"	9'1" ~11'1"	8'9" ~11'7"	8'5" ~12'4"	7'10" ~13'9"
3	2.93 ~3.07	2.90 ~3.10	2.86 ~3.15	2.81 ~3.22	2.74 ~3.31	2.64 ~3.47	2.53 ~3.68	2.36 ~4.09
7	6'11" ~7'1"	6'10" ~7'2"	6'9" ~7'3"	6'8" ~7'4"	6'7" ~7'6"	6'4" ~7'9"	6'2" ~8'1"	5'10" ~8'9"
2	1.97 ~2.03	1.95 ~2.05	1.94 ~2.07	1.91 ~2.10	1.88 ~2.14	1.83 ~2.21	1.77 ~2.29	1.68 ~2.46
5	4'11" ~5'1"	4'11" ~5'1"	4'10" ~5'2"	4'10" ~5'2"	4'9" ~5'3"	4'8" ~5'5"	4'6" ~5'7"	4'4" ~5'10"
1.5	1.48 ~1.52	1.47 ~1.53	1.46 ~1.54	1.45 ~1.56	1.43 ~1.58	1.40 ~1.62	1.36 ~1.67	1.31 ~1.76

(ft) (m)

f=60mm

Focused Distance	f/1.4	f/2	f/2.8	f/4	f/5.6	f/8	f/11	f/16
∞	671' ~∞	469' ~∞	335' ~∞	234' ~∞	167' ~∞	117' ~∞	84'11" ~∞	58'3" ~∞
∞	205 ~∞	143 ~∞	102 ~∞	71.5 ~∞	51.0 ~∞	35.7 ~∞	25.9 ~∞	17.7 ~∞
50	46'5" ~54'2"	45'1" ~56'1"	43'4" ~59'	41' ~63'11"	38'3" ~71'11"	34'9" ~88'5"	31'2" ~123'	26'7" ~370'
10	9.52 ~10.5	9.32 ~10.8	9.07 ~11.1	8.73 ~11.7	8.30 ~12.5	7.74 ~14.1	7.13 ~16.6	6.30 ~23.6
20	19'5" ~20'8"	19'2" ~20'11"	18'10" ~21'4"	18'4" ~22'	17'9" ~22'11"	16'11" ~24'5"	16' ~26'7"	14'7" ~31'3"
5	4.87 ~5.14	4.82 ~5.20	4.75 ~5.28	4.65 ~5.41	4.52 ~5.59	4.34 ~5.89	4.13 ~6.30	3.83 ~7.14
15	14'8" ~15'5"	14'6" ~15'6"	14'4" ~15'9"	14' ~16'1"	13'8" ~16'7"	13'2" ~17'5"	12'7" ~18'6"	11'8" ~20'9"
4	3.92 ~4.09	3.88 ~4.13	3.83 ~4.18	3.77 ~4.26	3.68 ~4.38	3.56 ~4.56	3.42 ~4.81	3.20 ~5.30
10	9'10" ~10'2"	9'9" ~10'3"	9'8" ~10'4"	9'6" ~10'6"	9'4" ~10'9"	9'1" ~11'1"	8'10" ~11'6"	8'4" ~12'5"
3	2.95 ~3.05	2.93 ~3.07	2.90 ~3.10	2.86 ~3.15	2.81 ~3.21	2.74 ~3.32	2.65 ~3.45	2.51 ~3.70
7	6'11" ~7'1"	6'11" ~7'2"	6'10" ~7'2"	6'9" ~7'3"	6'8" ~7'4"	6'6" ~7'6"	6'4" ~7'9"	6'1" ~8'2"
2	1.98 ~2.02	1.97 ~2.03	1.95 ~2.05	1.93 ~2.07	1.91 ~2.10	1.87 ~2.15	1.83 ~2.20	1.76 ~2.31
5	4'11" ~5'1"	4'11" ~5'1"	4'11" ~5'1"	4'10" ~5'2"	4'10" ~5'2"	4'9" ~5'3"	4'8" ~5'5"	4'6" ~5'7"
1.5	1.49 ~1.51	1.48 ~1.52	1.47 ~1.53	1.46 ~1.54	1.44 ~1.56	1.42 ~1.59	1.39 ~1.62	1.35 ~1.68

f=70mm

Focused Distance	f/1.4	f/2	f/2.8	f/4	f/5.6	f/8	f/11	f/16
∞	902' ~∞	631' ~∞	450' ~∞	315' ~∞	224' ~∞	157' ~∞	114' ~∞	78'2" ~∞
∞	275 ~∞	192 ~∞	137 ~∞	96.1 ~∞	68.6 ~∞	47.9 ~∞	34.8 ~∞	23.8 ~∞
50	47'3" ~53'1"	46'2" ~54'6"	44'10" ~56'6"	42'11" ~59'9"	40'8" ~64'10"	37'7" ~74'3"	34'4" ~90'7"	30'1" ~142'
10	9.63 ~10.4	9.48 ~10.6	9.28 ~10.8	9.01 ~11.2	8.66 ~11.8	8.19 ~12.8	7.67 ~14.3	6.92 ~17.7
20	19'6" ~20'6"	19'4" ~20'9"	19'1" ~21'	18'8" ~21'6"	18'3" ~22'2"	17'7" ~23'2"	16'9" ~24'8"	15'7" ~27'7"
5	4.90 ~5.10	4.86 ~5.15	4.80 ~5.21	4.73 ~5.31	4.62 ~5.44	4.48 ~5.65	4.31 ~5.94	4.05 ~6.49
15	14'9" ~15'3"	14'7" ~15'5"	14'5" ~15'7"	14'3" ~15'10"	13'11" ~16'3"	13'6" ~16'9"	13'1" ~17'7"	12'4" ~19'
4	3.93 ~4.07	3.91 ~4.10	3.87 ~4.14	3.82 ~4.20	3.75 ~4.28	3.65 ~4.42	3.53 ~4.60	3.35 ~4.93
10	9'10" ~10'2"	9'10" ~10'2"	9'9" ~10'3"	9'8" ~10'5"	9'6" ~10'7"	9'4" ~10'10"	9'1" ~11'2"	8'8" ~11'9"
3	2.96 ~3.03	2.94 ~3.06	2.92 ~3.08	2.89 ~3.12	2.85 ~3.16	2.79 ~3.24	2.72 ~3.34	2.61 ~3.52
7	6'11" ~7'1"	6'11" ~7'1"	6'10" ~7'2"	6'10" ~7'2"	6'9" ~7'3"	6'7" ~7'5"	6'6" ~7'7"	6'3" ~7'11"
2	1.98 ~2.02	1.97 ~2.03	1.96 ~2.04	1.95 ~2.06	1.93 ~2.08	1.90 ~2.11	1.86 ~2.16	1.80 ~2.24
5	5' ~5'	4'11" ~5'1"	4'11" ~5'1"	4'11" ~5'1"	4'10" ~5'2"	4'9" ~5'3"	4'9" ~5'4"	4'7" ~5'6"
1.5	1.49 ~1.51	1.48 ~1.52	1.48 ~1.52	1.47 ~1.53	1.45 ~1.55	1.44 ~1.57	1.41 ~1.60	1.38 ~1.64

Note:
Values given in the tables are measured from the focal plane (the "ϕ" mark engraved on the camera side).

CAMERA CARE

Good camera care is primarily common sense care. Treat your camera as you would treat any valuable precision instrument. Although the Nikon R10 Super Zoom cine camera is ruggedly built, it may be damaged by shock, heat, water or misuse. The following are basic tips for keeping your camera in top condition.

Storage

Store the camera in a carrying case when not in use to protect it from dust. Avoid storing the camera in excessively hot, cold or damp places.
Always attach a lens cap to the lens when storing the camera to prevent dust from settling on the lens surface.
Do not leave film in the camera for long periods of time.
Remove exhausted batteries before storing the camera for any length of time.

Lens

Keep the lens surface free from fingerprints and dust as much as possible.
Remove dust with a blower brush or lens tissue.
Never use cloth or ordinary tissue.
Do not use water on the lens' glass surfaces. If smudges or fingerprints persist, use lens tissue moistened sparingly with alcohol or lens cleaner. Remember that even approved lens cleaner can cause damage if it seeps into the lens mount.

Keep the Camera Away From Water

Avoid excessive moisture. When using the camera near water, guard against splashes, especially salt water spray.

Never Oil Any Part of the Camera

Lubrication should be left to an authorized serviceman.

Prior to taking a holiday trip or being assigned an important photo job, test your camera by making trial sequences. Check the meter. Remember, it takes at least two or three weeks for processing the test film and making any needed repair or adjustment.

ACCESSORIES

Hard Leather Case
Stores the camera with its lens hood left on the lens, spare batteries and various accessories. Two outside pockets hold spare cartridges and other small items.

Soft Case
Holds the cine camera only.

Slide-Copy Adapter ES-3
Used in combination with the lens macro control, the ES-3 allows you to copy standard 35mm format color or B & W transparencies.

67mm Screw-in Lens Cap

Rubber Lens Hood HR-3
Its use is recommended to prevent stray light from striking the lens surface and as an added measure of lens protection. A screw thread accepts a 72mm filter or lens cap.

Filters
72mm screw-in filters are available for use with the rubber lens hood HR-3. (Polarizing filter cannot be used)

Tape Recorder Synch Cord EA-2
Connects the tape recorder synch socket on the camera with a tape recorder and allows you to synchronize the film/tape recorder run.

Close-Up Attachment Lens EC-2
Attached in front of the camera lens, the EC-2 focuses down to approximately 1:1 reproduction ratio.

Remote Control Unit EA-1
Allows you to start and stop the camera from up to 10 feet away.

SPECIFICATIONS

Film:
Super-8 cartridges with automatic film speed setting from ASA 10—400 (daylight) and 16—640 (tungsten light)

Lens:
Cine-Nikkor Zoom lens 7-70mm f/1.4 (zooming ratio 1:10) with macrofocus and two-speed power zoom with manual override, focusing from infinity (∞) to 5 feet (1.5m) on normal control and from 90m down to 170mm from film plane on macro; multi-layer coating on glass surfaces; attachment size 67mm dia. (P=0.75mm)

Viewfinder:
SLR type finder with split-image rangefinder; 0.53 to 5.32X magnification with eyesight adjustment from −5 to +3 diopters; f/number display with under- or overexposure warning marks, film-end mark, with eyepiece shutter control and rubber eyecup; shutter blade opening visible in inspection window

Film Speeds:
18, 24, 54 fps driven by a micromotor plus single frame

Variable Shutter:
160° to 0 movement range

Exposure Meter:
Electric eye with servo-motor diaphragm control through TTL metering with EE lock and manual override; high-contrast light compensation from −1 stop to +2 stops by scale.

Footage Counter:
Additive, automatic resetting

Shutter Release:
Electromagnetic, dual-action trigger with lock-run control

Film Rewind:
Automatic up to approx. 100-frame rewind

Fade:
Automatic fade-in, fade-out with manual override

Overlap:
Through variable shutter and film rewind

Double Exposures:
Automatic up to approx. 100 frames

Reverse Filming:
Automatic up to approx. 100 frames

Power Source:
Six penlight batteries power motor of film transport, exposure meter and zoom motor, housed inside hand-grip

Battery Checker:
LED lamp glows when batteries are adequate

Type A Filter:
Built-in for color temperature compensation

Speedlight Synch Terminal:
Accepts standard synch cord for automatic illumination of single frames

Tape Recorder Synch Terminal:
Accepts accessory cord to synchronize film/tape recorder run

Remote Control Socket
Accepts remote control unit

Dimensions:
68 x 200 x 260mm

Weight:
1.93kg

Hand-Grip:
Fixed

Designs and specifications are subject to change without notice.

NIKON WARRANTY

The Nikon Worldwide Service Warranty Registration Card, which identifies your Nikon R10 Super Zoom cine camera by its serial number, is your guarantee that the camera you buy is a new one. When you return this card to a Nikon distributor you will receive your Nikon Worldwide Service Warranty Certificate, which entitles you to a one-year warranty anywhere throughout the world, subject to the conditions listed in the certificate.

Only an authorized Nikon dealer can provide you with a Nikon Warranty Registration Card. We cannot guarantee any camera or lens sold to you by an unauthorized dealer without a Warranty Registration Card, since it may be second-hand equipment.

Nikon

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